

Photo: Yukon Energy



Yukon Electric Thermal Storage Demonstration Project:

Lead the Charge
to a Greener Yukon

**Take part in building a greener future
for Yukon today!**

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[yukonconservation.org/programs/energy/
electric-thermal-storage/](https://yukonconservation.org/programs/energy/electric-thermal-storage/)
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What do you know about the Yukon Electric Thermal Storage project?

The Yukon Conservation Society (YCS) is leading an Electric Thermal Storage (ETS) Demonstration project over the course of the next two years. We will be installing ETS home heating systems and collecting data from 40 or more participant homes in and around Whitehorse. Through this project, we intend to figure out how ETS can be used to shift peak power consumption and help reduce the amount of liquefied natural gas and diesel Yukon Energy needs to use when demand for electricity is highest.

We need you to be a green tech pioneer!

The ETS Demonstration project can only happen with your help. Yukoners will provide the driving force behind this project by installing ETS units in their homes.

Photo: Yukon Conservation Society



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ETS— What, Why, Where, and When

“ETS is an energy storage technology that allows electricity to be converted to heat and stored for use later.”

What is electric thermal storage?

Electric thermal storage (ETS) is an energy storage technology that allows electricity to be converted to heat and stored for use. The ETS units installed in this project will use electricity to heat bricks in home heating units. The heat in those bricks can be released later to heat the surrounding space, separating when the heat is produced from when it is released into the home.

Why is ETS an interesting technology?

ETS is exciting for a few reasons. In Nova Scotia, and elsewhere, ETS has helped with peak shifting, which reduces strain on electrical infrastructure. In Yukon, shifting the winter peak also means making better use of existing hydropower, and enabling utilities to use less diesel and LNG to produce power. For people wanting to drop fossil fuel heating and switch to electric, ETS is a home heating technology that could let them do so, without adding to winter peaks. ETS has also been beneficial elsewhere, including Alaska and PEI, in support of renewable energy. Intermittent renewable energy technologies, like wind and solar power, often produce electricity in excess of what consumers are demanding at any given moment; with ETS technology, instead of ‘spilling’ this extra power, it can be put to use as heat. In Yukon, where the heating season often lasts from September to May, an electric storage system that also heats your home is a win-win!

Where and when else has ETS been used?

ETS has been in use in Europe since after the second world war, and in North America since the 1970s. It has been shown to be successful for increasing integration of wind power in PEI and Alaska. ETS has also helped with peak shifting in Nova Scotia.

Who is working on this project?

Yukon Conservation Society is heading the Yukon's Electric Thermal Storage Demonstration project. We will be working with participants to make sure their experience with this project is as smooth as possible. We will also be coordinating closely with our project partners: Yukon University's Northern Energy Innovation (NEI) team, Yukon Energy, and the Yukon government's Energy Branch. NEI will be researching the viability of ETS in Yukon and assessing its technical performance. The Yukon government's Energy Branch is providing us with guidance and support while assisting us in our efforts to assess the energy efficiency of project applicants' homes. Yukon Energy will be managing the preferred charging times of participant's ETS units.



What kinds of ETS units are being used in this project?

We are working with two ETS unit vendors in this pilot project. Coldbrook Electric Supply, based in Nova Scotia, sells ECOMBI ETS units which are manufactured and imported from Spain. ECOMBI units are small, wall-mounted units that are effective baseboard replacements. We are also working with Steffes, which offers a wide variety of ETS units including replacements for forced air and hydronic furnaces as well as space heater units.

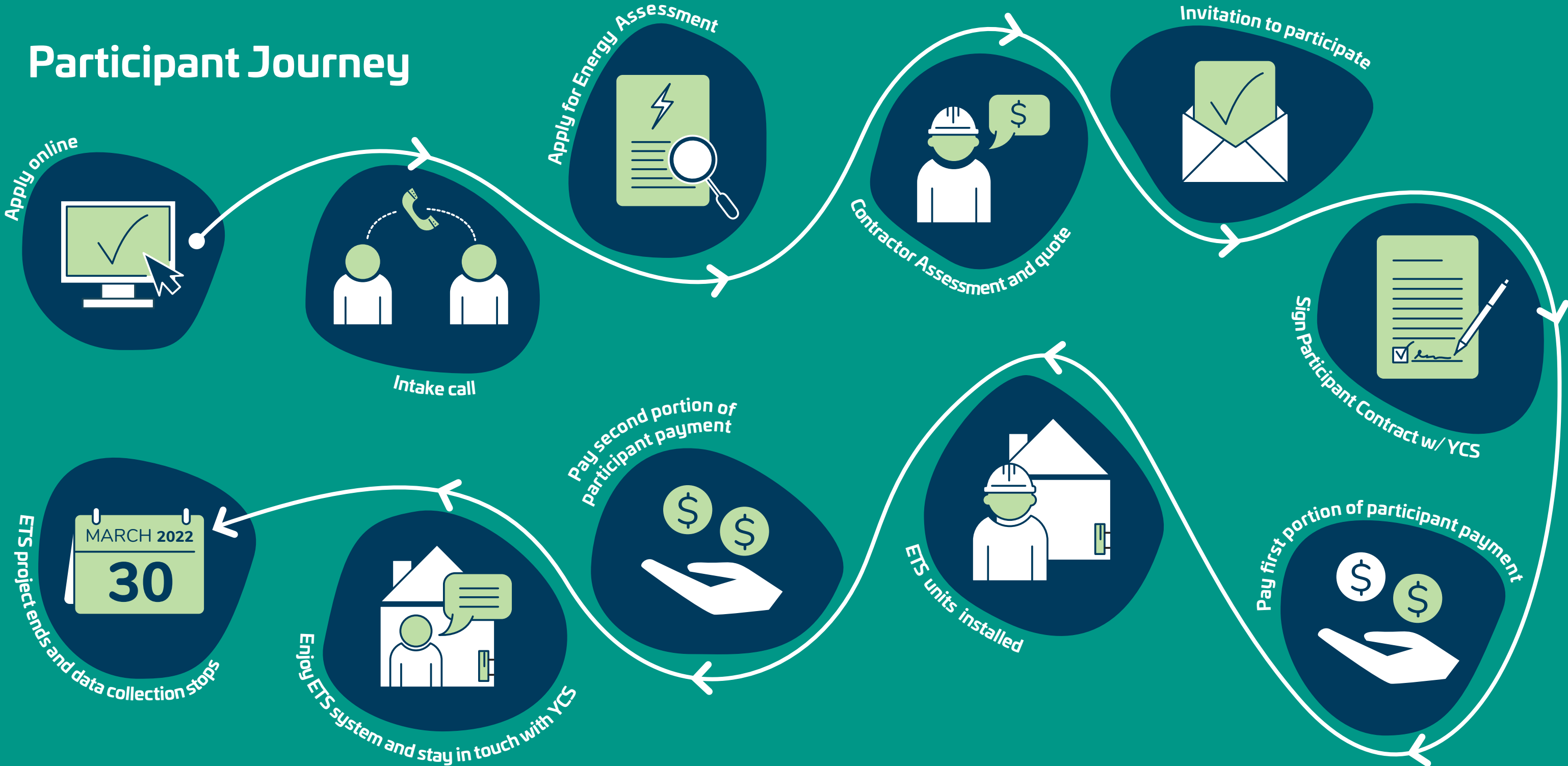
www.steffes.com/electric-thermal-storage/
www.ecombi-northamerica.com/

What does participating in this pilot project entail?

Taking part in the Yukon Conservation Society's (YCS) ETS project takes a little bit of work. First, applicants need to submit an application on our website. Then you will need to answer some of our questions in a phone call. Next, you'll need to apply to have an Energy Assessment done for your home so we can answer some of our key research questions and you'll need to send us photos of your home heating setup. From that point, if your home appears to be right for the project and you're comfortable with us doing so, we'll connect you with our contractor (Solvest, working in coordination with Certified Heating) for them to come by for an "ETS Assessment" and draw up a quote for the ETS system that would be right for your home. Solvest will pass that quote to YCS, and if it is in line with our budget and expectations, we will attach it to your Participant Contract, and forward it to you in an invitation package. Once you've signed the Participant Contract, you'll pay the first half of your 25% of the cost and we'll pay the first half of our 75%. Once your system is installed, we'll each pay the balance on our portion of the costs. Refer to page 9 for more information on the costs associated with participating. Finally, your ETS units will start logging data. From that point on, participation is pretty easy. You'll just keep living in your home, adjusting your thermostat if you're too hot or cold. The only real difference will be that your home heating system is a little smarter and greener than before.



Participant Journey



How will my data and personally identifiable information be protected?

None of the personal information you share with the Yukon Conservation Society (YCS) will be shared without your explicit consent. Over the next two heating seasons (2020 to 2021 and 2021 to 2022), de-identified data* from your ETS system (and possibly some supplementary data collection devices) will be sent to secure servers kept by YCS or two of our project partners: Northern Energy Innovation and Yukon Energy. Yukon Energy will set the preferred charging times for your ETS units. You will set your home thermostats to your preferred temperature; when those two settings come into conflict your ETS system's output will be based on the thermostat – not the utility. All details on participant expectations, including data collection, will be clearly laid out in the Participant Contract.

Does that mean that I won't have control over my thermostat?

No. When the charging times set by Yukon Energy aren't sufficient to heat your home to the temperature you've set your thermostat, your thermostat will override the utility's control. In other words, if, for example, your ETS unit has been charged for a 4-hour period overnight and it discharges all its stored heat before lunchtime, your ETS unit will kick back into charging mode as necessary to keep providing heat to your home.

* **DE-IDENTIFIED DATA:** each participant's ETS system will be assigned a numerical code that will be used to identify their data. So YCS's project partners won't know who's been producing what data. Only YCS will have a key matching the numerical codes assigned to each participant with their contact information.

Would participating save me money?

Participants should not expect to save money on their heating bill by participating in this project because their homes will still require the same amount of energy to be heated; your heat will just be generated at a different time than when you need it. However, a total contribution of 85% of the cost of a new furnace will likely be a financial benefit for participants. There are also indirect financial benefits associated with the reduction in fossil fuel consumption for the generation of electricity, not to mention the environmental and social benefits.

How much will participating cost me?

The Yukon Conservation Society (YCS), through governmental financial support, will be covering a total of 85% of the purchase and installation costs for participants, with the participant responsible for the remaining 15%. This contribution will come in two stages, with 75% covered by YCS at the time of installation and the participant responsible for the remaining 25% at that time, followed by a 10% reimbursement by YCS to the participant at the end of the project. Half of the 25% that participants are initially responsible for will be paid as a deposit prior to installation. Participants whose homes are currently primarily heated with a forced-air furnace can expect to pay around \$5000 for their ETS system upon installation* (approximately \$3000 once the additional 10% is reimbursed!), with the upfront cost of ETS systems for homes heated by hydronic furnaces expected to be more and those heated by space heaters or electric baseboards expected to be less.

Can I withdraw from the project if I change my mind about participating?

If you change your mind before installations take place, you can opt out without any issues beyond the forfeiture of your deposit (half of 25% of the quoted amount). If you have already had your ETS units installed, then you may still be able to withdraw, though YCS will do our best to help you remain in the project. In the case that you back out once your ETS system is in place, you will no longer be eligible for the additional 10% contribution at the project's culmination. Withdrawals will be addressed on a case-by-case basis.

* **NOTE:** These prices do not include the cost of an electric service upgrade, which may be required. Up to \$5000 of this cost will be included in the purchase and installation costs of which YCS will be covering a total of 85%.

“The Yukon Conservation Society, through governmental financial support, will be covering a total of 85% of the purchase and installation cost of the ETS systems...”

Data, Data, Data

What kind of 'data' will be collected?

The electric thermal storage (ETS) units used in this project will be configured to automatically send de-identified* charging and discharging timestamped data to an online portal. These data will be stored on Canadian and American servers.

Who will have access to my data?

Yukon Energy will have access to your de-identified data* which will be associated with a unique identifier number linked to the feeder number of your neighborhood – a number shared with many other houses – with any information that could link the data back to you or your home removed. Northern Energy Innovation (NEI) at Yukon University will also have access to the same de-identified data as Yukon Energy as well as some supplemental data to assist their assessment efforts.

Why do the project partners need those data?

Yukon Energy only needs access to the data strictly required for ETS unit charging time control. NEI needs the data it will be collecting so they can answer the project's research questions, which are available upon request.

How will you make sure that my data is kept private and secure?

The Yukon Conservation Society (YCS) is going to every effort to ensure the safety and security of your data. We are coding all data collected via ETS units and collection devices to remove anything that could be used to link the data back to you or your home. We are also making sure applicant and participant personally identifiable information provided to us in the intake process, like names, addresses and emails, are protected using two factor authentications. If you have any questions or concerns about how we are protecting your information, please feel free to contact us.

* **DE-IDENTIFIED DATA:** each participant's ETS system will be assigned a numerical code that will be used to identify their data. So YCS's project partners won't know who's been producing what data. Only YCS will have a key matching the numerical codes assigned to each participant with their contact information.

Device Installation – How, Who, When, and What Then

“Solvest will draw up a quote for the purchase and installation of an appropriate ETS system for the selected applicant.”

How invasive will installations be?

This will vary by installation. We will be selecting participants with this factor in mind. For example, furnace installations that require the removal of existing fossil fuel (oil or propane) furnaces and fuel tanks will be most invasive while baseboard replacement installations will typically be far less intrusive.

When will installations happen?

We are aiming to begin installations this July and continue them into the fall of 2020. Next year, installations will continue beginning in the spring and continuing into the summer of 2021.

Who will be doing the installations?

Solvest, a local expert in renewable technology and electrical installations, will be partnering with Certified Heating to install wall-mounted and furnace-style electric thermal storage (ETS) units.

What do I do to arrange an installation?

The participation selection process begins with registering on the Yukon Conservation Society (YCS) website. YCS will select potential participants based on our eligibility criteria and applicants' home heating setups. Our contractor, Solvest, will contact selected applicants to schedule an ETS assessment. Following the assessment, Solvest will draw up a quote for the purchase and installation of an appropriate ETS system for the selected applicant. They will send the quote to YCS. If it fits within the project budget, the quote will be attached to the Participant Contract and forwarded to the selected applicant in an invitation package. The applicant will be asked to sign the Participation Agreement prior to any payments or installation work.

How will payment work for my ETS units and installation?

Half of the 25% of your ETS system's purchase and installation cost will be due following the signing of the Participation Agreement, paid to the contractor, with the other half due upon the installation of your ETS system. YCS will cover the other 75% by paying the contractor directly. The 10% reimbursed by YCS at the end of the project, provided no breach of the Participation Agreement occurs, will be provided by YCS to the participant via cheque.



What will I need to do during the project, once my ETS system has been installed?

In essence, nothing! Once installed, your electric thermal storage (ETS) system has been designed to require minimal maintenance by the homeowner. Each ETS unit will come with a complete care and operations manual which will lay out exactly what ETS owners can expect. In terms of controlling your ETS system, baseboard-style and space heater-style ETS units have onboard thermostats while furnace-style ETS units typically use wall-mounted thermostats. YCS staff may need to enter participants' homes to collect data or inspect the ETS system, but ample notice will be provided in any such cases.

What do I do if my internet goes down?

If your internet goes down unexpectedly, please reboot your internet system as usual, and shoot us an email at ets@yukonconservation.org so we can make sure everything is still going smoothly once your internet is up and running. Any expected internet interruptions—if you're planning to disconnect your modem or router for an upgrade or any other reason—should be brought to the Yukon Conservation Society's attention with as much notice as possible.

Will my internet usage increase? Who will pay for overage charges?

The ETS and supplementary data collection devices are expected to transmit less than 1GB per month of data. This is an estimate and it may vary slightly. That said, participants are expected to maintain their own internet connection throughout the project.

What do I do if my device malfunctions?

If your ETS system is malfunctioning or if you have any other concerns about the project or your ETS system, please contact the YCS ETS team at ets@yukonconservation.org or call: 867-668-5678 ext. 6.

Device Operation –
Control, Thermostats,
and Upkeep, Oh My

What's Next

“The Northern Energy Innovation (NEI) team at Yukon University will publish the results of this project in a public report following its conclusion.”

How will the results of this project be shared?

The Northern Energy Innovation (NEI) team at Yukon University will publish the results of this project in a public report following its conclusion. Yukon Conservation Society (YCS) may also announce the results on its website, social media platforms, newsletters, and elsewhere. No individual participants will be identified in the results or any other publicly available documentation without their informed and written consent.

How will we know if the project was a success?

This pilot project is intended to explore the use of electric thermal storage (ETS) in Yukon. As long as we are able to definitively answer our research questions this project will have been a success, even if the results from the research questions are not what we were hoping for.

Does this mean Yukon will be able to put up more wind turbines?

Policies or programs that encourage the adoption of storage technologies, like ETS, may support greater integration of renewable energy technologies, like solar and wind power, on the Yukon Integrated System. Demonstrating that possibility is one of this project's intentions.

Does this project mean Yukon is getting time-of-use rates soon?

There is currently no plan in place to introduce time-of-use rates in the territory. However, the results of this project may help inform any governmental decisions regarding time of use rates.

Is this project associated with Yukon Energy's "PeakSmart" program?

No. While Yukon Energy is one of our official project partners and the two projects have similar ambitions, there is no formal link between our Yukon Electric Thermal Storage Demonstration project and Yukon Energy's PeakSmart program.